

Name: \_\_\_\_\_ Date: \_\_\_\_\_

## Polynomial Operations EXAM (version 223)

1. Let polynomials  $p(x)$  and  $q(x)$  be defined below.

$$p(x) = 2x^5 + 6x^3 - 3x^2 - 8x - 5$$

$$q(x) = -6x^5 + 2x^4 - 4x^3 - 3x^2 - 7$$

Express the difference  $p(x) - q(x)$  in standard form.

2. Let polynomials  $a(x)$  and  $b(x)$  be defined below.

$$a(x) = -2x^2 - 4x + 6$$

$$b(x) = 7x - 6$$

Express the product  $a(x) \cdot b(x)$  in standard form.

3. Express  $(x + 1)^4$  in standard (expanded) form.

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4. Let polynomials  $f(x)$  and  $g(x)$  be defined below.

$$\begin{aligned}f(x) &= 6x^3 + 20x^2 - 15x - 6 \\g(x) &= x + 4\end{aligned}$$

The quotient of  $\frac{f(x)}{g(x)}$  can be expressed as a polynomial,  $h(x)$ , and a remainder,  $R$  (a real number).

$$\frac{f(x)}{g(x)} = h(x) + \frac{R}{x + 4}$$

By using synthetic division or long division, express  $h(x)$  in standard form, and find the remainder  $R$ .

5. Let polynomial  $f(x)$  still be defined as  $f(x) = 6x^3 + 20x^2 - 15x - 6$ . Evaluate  $f(-4)$ .